

Applicant : Steven M. Zuniga, et al.
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Attorney's Docket No.: 05542-303002 / 2834C1/CMP

Attached is a copy of a Declaration by Dai Dee Pun as filed in the Re-examination Serial No. 09/006,260 of the parent application. Applicant submits that the Declaration provides evidence of commercial success of the invention in the present application.

First, the commercial success of the TITAN composite ring is shown by the fact that between its initial introduction in 1998 and FY 2002, the TITAN composite ring grew to a 88% share of retaining rings sold by Applied Materials for the 200mm TITAN carrier head, and by the fact that Applied Materials has derived over fifty-two (52) million dollars in revenue from the sale of TITAN composite rings.

Second, because both the TITAN PPS rings and TITAN composite rings were available for purchase and fit interchangeably onto the TITAN wafer carrier, buyers of the Applied Materials TITAN wafer carrier were not locked into the purchase of any particular type of retaining ring. Thus, the commercial success of the TITAN composite ring was not due to features of the wafer carrier.

Third, since the market share of the TITAN composite ring increased even while it was more expensive than the TITAN PPS ring, the commercial success of the TITAN composite ring was not due merely to pricing.

Fourth, the invention is linked to the commercial success. A primary advantage of the invention to the customer is reduction or elimination of the so-called "break-in time". Specifically, a more rigid ring is less subject to deformation when attached to the carrier head, and consequently requires less time for the lower surface to be worn into a profile that is stable from wafer-to-wafer. The relationship between the claimed two-layer structure and this potential advantage (described as elimination of lapping) is discussed at page 8, lines 8-12 of the specification. The reduced break-in time permits the polishing apparatus to be used more quickly after installation of the retaining ring, thereby decreasing cost-of-ownership.

In summary, customers had the option of purchasing the TITAN composite ring (with components corresponding to those of the claimed invention) or the TITAN PPS ring for the 200mm TITAN wafer carrier, and yet purchased the TITAN composite ring even when it was more expensive than the TITAN PPS ring. In view of the foregoing, Applicant submits that

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there is both evidence of commercial success and a nexus between the commercial success and the claimed invention.

B. Hoshizaki fails to teach a retaining ring fixed to and abutting a rigid base

The Examiner argues that Hoshizaki teaches a retaining ring with an upper portion having a top surface fixed to and abutting a base. Applicant respectfully disagrees.

The Examiner equates the base with top plate 274 of Hoshizaki, and equates the retaining ring with the retention ring 282 and wear ring 291. However, the retention ring 282 does not abut the top plate 274. Instead, the retention ring 282 is spaced apart from the top plate 274 by the retention ring flexure 284.

Thus, Hoshizaki fails to teach a carrier head in which a top surface of the upper portion of the retaining ring abuts a rigid base, as required by claim 1, or a retaining ring in which the top surface of the upper portion is configured to be mechanically affixed to and abut a rigid base of a carrier head, as required by claims 13 and 25. Thus, the Examiner's rejection of claims 1, 13 and 25, and the claims depending therefrom, should be withdrawn.

C. Kim and Kubo fail to suggest modifying Hoshizaki to provide a retaining ring in which the top surface of the upper portion is affixed to and abuts a rigid base

1. Hoshizaki

First, Hoshizaki itself teaches away from a retaining ring mechanically secured to and abutting a rigid base. Specifically, Hoshizaki teaches that "Flexure member 284 allows retention ring 282 to move in a vertical direction" (see column 11, lines 37-38). If Hoshizaki's retention ring 282 was abutting the top plate 274, then Hoshizaki's ring would no longer be able to move independently of the top plate 274, and the vertical position could not be adjusted. Consequently, Hoshizaki teaches away from having the top surface of the upper portion abut the rigid base, and therefore teaches away from the claimed structure.

2. Kim

The Examiner relies on Kim to teach a retaining ring with "two joinable parts". In addition, the Examiner relies on Kim to teach mechanical affixing the retaining ring to the base using screws.

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First, although Kim discusses a retaining ring formed in two joinable parts, the position and relationship of these parts is unclear. For example, Figure 2 appears to illustrate that the upstanding ring portion 40 would fit on top of the pressure plate 28, whereas Figure 3 appears to illustrate that the upstanding ring portion 40 is part of the pressure plate 28 (and thus would be equivalent to the base). In short, Applicant submits that the only elements which would clearly be equivalent to a retaining ring with an upper surface abutting the base are the annular flange member 45 and the retainer rings 200 and 300, all of which are illustrated (in Figures 3, 7, 11 and 12) as having only a single layer.

Second, although Kim does teach a carrier in which a retainer ring is affixed to and abuts a pressure plate (e.g., elements 200 and 28 in FIG. 12) with screws, Kim's attachment configuration would not be applied to Hoshizaki to provide the claimed structure. Specifically, in Kim's system, the bottom surface 212 of the retaining ring is spaced apart from the polishing pad (e.g., see FIG. 12 and column 8, lines 53-56 of Kim, which discuss that the bottom surface of the workpiece projects below the bottom surface 212 of the retaining ring). Consequently, if Hoshizaki's carrier were modified as shown by Kim to eliminate the flexure member 284, then the bottom surface of the retaining ring would be spaced apart from the polishing pad, rather than contact the polishing pad as provided by claims 1, 13 and 25.

3. Kubo

The Examiner also relies on Kubo to teach a retaining ring with a rigid upper insert ring and a lower plastic portion. However, Kubo also teaches away from a retaining ring in which the upper surface of the upper portion is secured to and abuts a rigid base. Specifically, Kubo teaches that a compressible backup ring 5 is needed between the rigid insert ring 6 and the plate 9 so that as the thickness of the workpiece 7 changes during polishing, the surface 4a of the retainer ring 4 is kept at the same level as the surface 7a of the workpiece 7 (see column 6, lines 6-16). If Kubo's ring was modified to remove the compressible backup ring so that the insert ring 6 would abut the plate 9, then the bottom surface 4a of the retaining ring would not keep at the same level as the surface 7a of the workpiece 7. Consequently, Kubo teaches away from

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having the top surface of the upper portion abut the rigid base, and therefore also teaches away from the claimed structure.

Since the references relied upon by the Examiner actually teach away from the claimed subject matter, the Examiner's rejection of claims 1, 13 and 25, and the claims depending therefrom, should be withdrawn.

Please charge the \$950.00 fee for the Petition for Extension of Time to Deposit Account No. 06-1050. Please apply any other charges or credits to deposit account 06-1050 referencing Attorney Docket No. 05542-303002.

Respectfully submitted,

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